

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method for optically detecting labeled molecules that have participated in a chemical reaction with a reagent supported on a surface and that have become temporarily supported at the site of the reagent, comprising:

- a) providing a flow cell;
- b) providing within said flow cell a solid support having a surface;
- c) supporting at least one reagent molecule to said surface;
- d) introducing two flowing solutions into said flow cell, wherein one of the two flowing solutions comprises a labeled molecule with a concentration above 10⁻⁸ M that can contact said at least one reagent molecule, and one of the two flowing solutions comprises buffer with no detectable labels, and wherein the two flowing solutions are at different locations within the flow cell at any time;
- e) immersing the at least one reagent molecule in the flowing solution comprising a labeled molecule;
- f) switching or directing the two flowing solutions with respect to the at least one reagent molecule, or switching the location of the at least one reagent molecule with respect to the two flowing solutions, to immerse the at least one reagent molecule in the flowing solution comprising buffer with no detectable labels;
- g) providing a light source for illuminating an illumination zone within the flowing solution comprising buffer with no detectable labels;
- h) providing a detector for detecting light emitted from the illumination zone;

- i) substantially simultaneously to said switching or directing the two flowing solutions with respect to the at least one reagent molecule, or switching the location of the at least one reagent molecule with respect to the two flowing solutions, switching at least one of said light source, detector, or location of said at least one reagent molecule to cause the label of a labeled molecule which has reacted with said at least one reagent molecule to pass through said illumination zone; and
- j) detecting light emitted at said illumination zone to detect the presence of one or more labeled molecules,

wherein a series of chemical reactions is detected by repeating said steps of introducing the flowing solutions into said flow cell, immersing said at least one reagent molecule in the solution comprising labeled molecules, switching or directing the flowing solutions with respect to the at least one reagent molecule, or switching the location of the at least one reagent molecule with respect to the flowing solutions, switching at least one of said light source, detector, or location of said at least one reagent molecule to cause the label of a labeled molecule which has reacted with said at least one reagent molecule to pass through said illumination zone; and detecting light emitted at said illumination zone to detect the presence of one or more labeled molecules,

the time interval between successive chemical reactions controlled by controlling the time between successive repetitions.

Claim 2 (original): A method according to claim 1 wherein a single labeled molecule is detected by said step of detecting light emitted at said illumination zone.

Claim 3 (withdrawn)

Claim 4 (original): A method according to claim 1 wherein a single chemical reaction is detected by detecting the presence of a single labeled molecule that has participated in said chemical reaction by said step of detecting light emitted at said illumination zone.

Claim 5 (withdrawn)

Claim 6 (withdrawn)

Claim 7 (withdrawn)

Claim 8 (withdrawn)

Claim 9 (original): A method according to claim 1 wherein the label is a fluorescent label.

Claim 10 (previously presented): A method according to claim 1 wherein the at least one reagent molecule is a complex comprising a surface-bound polymerase enzyme and a nucleic acid or a supported nucleic acid and a polymerase, and the solution of labeled reactive molecules comprises at least one type of fluorescently labeled NTP molecule with no quenching moiety.

Claim 11 (original): A method according to claim 10 wherein said fluorescent labels are attached to the beta or gamma phosphate of the NTP.

Claim 12 (original): A method according to claim 1 wherein two or more distinguishable types of labels are used to label two or more different types of reactive molecules.

Claim 13 (previously presented): A method of claim 1 wherein optical detection of the labels includes identifying the labels by a property selected from the group consisting of color of excitation light or emission light, fluorescence lifetime, fluorescence brightness, electrophoretic mobility, location of detection, and time of detection.

Claim 14 (currently amended): A method according to claim 3 1 wherein an array of supported reagents is used and wherein optical detection of the reactions ~~are~~ is separately accomplished for each reagent of the array.

Claim 15 (withdrawn)

Claim 16 (withdrawn)

Claim 17 (withdrawn)